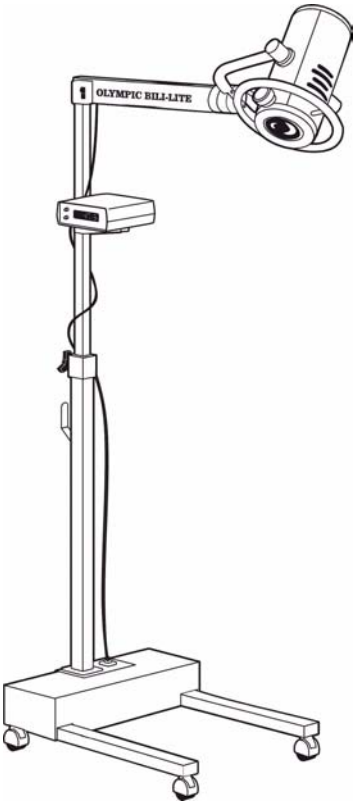
OLYMPIC MEDICAL



Instruction Manual

OLYMPIC BILI-LITE™

Model 80/81

⚠ CAUTION	Read and be familiar with this manual before installing, operating, or servicing this device. To ensure operator, technician, and patient safety, use only as specified in this manual.

51480-IMA-EN0103Q

OLYMPIC MEDICAL
5900 First Ave S
Seattle, WA 98108 USA

Toll-free: 1-800-426-0353 (US/Canada)
Phone: 206-767-3500 (worldwide)
Fax: 206-762-4200
Web: www.OlympicMedical.com

© 2005 Olympic Medical Corporation. All rights reserved.

Contents

Section 1 **Overview** 1-1

Conventions 1-1

Symbols 1-2

Intended Use 1-3

Description 1-3

Accessories 1-4

Irradiance 1-5

Section 2 **Assembly** 2-1

Assembling the Bili-Lite 2-1

Testing the Bili-Lite 2-5

Section 3 **Operation** 3-1

Operating the Bili-Lite 3-2

Positioning the Light 3-3

Measuring Irradiance 3-4

Measuring Treatment Time 3-4

Section 4 **Maintenance** 4-1

Cleaning the Bili-Lite 4-1

Cleaning the Bulb 4-2

Cleaning the Bili-Timer (Model 81) 4-2

Replacing the Bulb 4-3

Bulb Timer 4-3

Replacing the Battery (Bili-Timer) 4-5

LOW BAT Signal 4-5

Section 5 **Troubleshooting** 5-1

Technical Support 5-2

Section 6 **Service** 6-1

Repair Policy 6-1

Repair Procedures 6-2

Resetting the Thermal Protector 6-2

Replacing the Thermal Protector 6-3

Replacing the Fan 6-4

Replacing the Fuses 6-6

Replacing the Fuse Block 6-8

Replacing the Toroidal Transformer 6-9
Replacing the Power Switch. 6-11
Replacing the Ceramic Bulb Socket. 6-13
Returning for Service 6-15

Section 7 Replacement Parts 7-1

Ordering Information 7-1
Parts and Accessories 7-1

Section 8 Specifications 8-1

Electromagnetic Specifications – Manufacturer's Declaration 8-3
Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the Bili-Lite 8-5

Appendix A Drawings and Schematics A-1

Section

1

Overview

This manual provides the necessary information to assemble, maintain, and service the Olympic Bili-Lite™ Model 80/81. The operating and maintenance instructions are intended for medical personnel; the service instructions are intended for qualified service technicians.

Conventions

The following conventions are used in this manual:

Table 1.1 Conventions

Convention	Description
NOTE	Notes provide additional information to clarify a point in the text.
CAUTION	Cautions indicate situations that, if not avoided, could result in minor to moderate injury to the patient or operator, or damage to the equipment.
WARNING	Warnings indicate situations that, if not avoided, could result in serious injury or death to the patient or operator.
BUTTON	This character style represents buttons and controls that the user can touch or press.

Symbols

The following symbols are located on the Olympic Bili-Lite and its packaging:

Table 1.2 Product symbology

Symbol	Definition
	Alternating current (ac) voltage
	Atmospheric pressure
	Battery
	Caution, read instructions
	Electrical shock hazard
	Eye protection to be worn by infants
	Fuse
	Protective earth (ground)
	Humidity, condensing

Symbol	Definition
L	Line (hot conductor)
O	Mains power OFF
I	Mains power ON
N	Neutral (neutral conductor)
	Nonionizing electromagnetic radiation
	Shipping
	Storage
	Temperature
	Type B equipment

Intended Use

The Olympic Bili-Lite™ Model 80/81 is a floorstand phototherapy light intended to provide therapeutic irradiance to treat neonatal hyperbilirubinemia.

Model 81: The Olympic Bili-Timer™ is intended to measure total phototherapy treatment time.

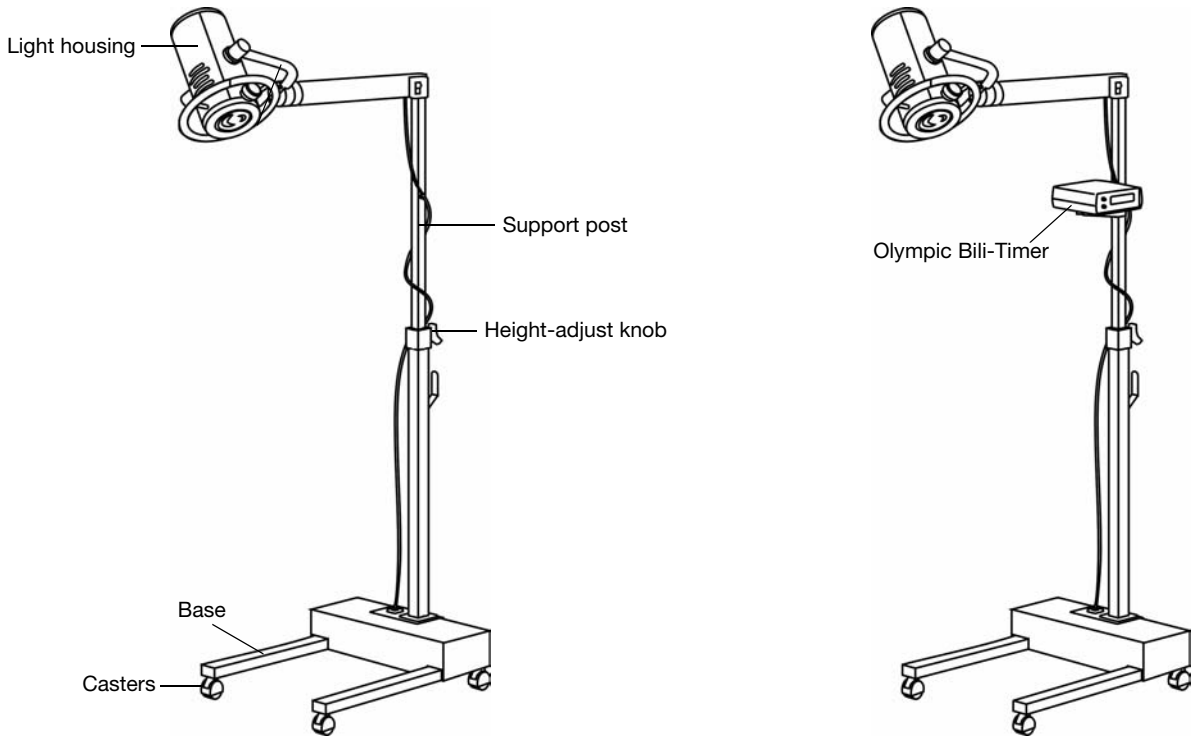
Description

The Olympic Bili-Lite Model 80/81 is a floorstand halogen phototherapy light. The lighthood is adjustable from 46.5 to 63.0 in. (118 to 160 cm) above the floor.

The Model 81 includes an Olympic Bili-Timer™, with photodetector, wiring, and shelf for attaching the timer to the Bili-Lite. The Bili-Timer is a digital timer that automatically measures total phototherapy exposure time. The photodetector on the Model 81 automatically starts the timer when the phototherapy light is turned on.

NOTE While the Model 80 does not include a photodetector and cannot be equipped with an Olympic Bili-Timer, the Models 80 and 81 are assembled, operated, and serviced in a similar manner.

Figure 1.1 Olympic Bili-Lite Model 80/81



Model 80 **Model 81**

Accessories

Olympic Medical offers the following items that are compatible for use with the Bili-Lite Model 80/81:

- Olympic Bili-Meter™, which measures the irradiance output of phototherapy.
- Olympic Bili-Mask™, which protects the patient's eyes during phototherapy treatment.

To order these items, see page 7-1.

Figure 1.2 Bili-Meter with Type B-22 sensor

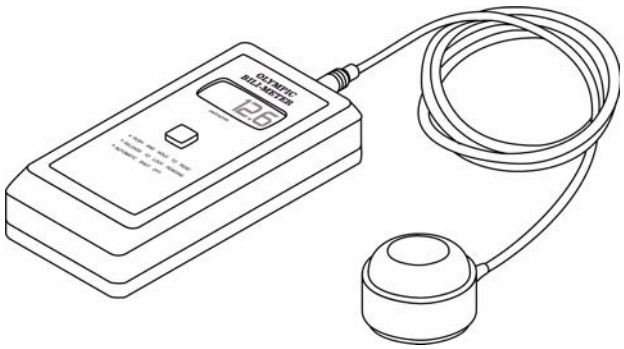


Figure 1.3 Bili-Mask styles

"Quick-Stick" "Standard" "Easy-On"

Irradiance

The therapeutic irradiance of phototherapy lights is measured with radiometers, instruments with optical filters that pass only selected portions of the blue-green action spectrum of bilirubin. Irradiance (radiant power) is expressed in units of microwatts per square centimeter per nanometer ($\mu W/cm^2/nm$).

The Olympic Bili-Meter[1]—the radiometer widely used in nurseries—measures irradiance from 425 to 475 nanometers (nm). Standard 60601-2-50 of the International Electrotechnical Commission (IEC) also requires that irradiance from 400 to 550 nm be measured. The following tables show this data.

NOTE The differences between the Olympic Bili-Meter and the IEC measurements do not represent a difference in the ***total*** irradiance output of the same bulbs. The difference results from ***averaging*** the irradiance of the same bulbs over wavelength bands of different widths. The Olympic Bili-Meter measures from 425 to 475 nm — nearly all irradiance of the blue bulbs occurs in this 50-nm band. The IEC measures irradiance from 400 to 550 nm — a 150-nm band; therefore, the ***average irradiance per nanometer*** of the IEC measurement will differ from the Bili-Meter measurement.

The irradiance data for the Olympic Bili-Lite Model 80/81, below, uses two different types of blue fluorescent bulbs at varying distances. Average irradiance is measured over an effective surface area of 9.5 in. (24 cm) in diameter. Maximum irradiance is measured at the center of the area.

Table 1.3 Average irradiance using the Olympic Bili-Meter (425–475 nm)

	Distance from lens to top of light sensor		
	20 in. (51 cm)	**25 in. (64 cm)**	**30 in. (76 cm)**
Irradiance $\mu W/cm^2/nm$	14.0	8.4	4.9
Effective area (diameter)	5.7 in. (14 cm)	7.5 in. (19 cm)	9.5 in. (24 cm)

Table 1.4 Maximum irradiance using the Olympic Bili-Meter (425–475 nm)

	Distance from lens to top of light sensor		
	20 in. (51 cm)	**25 in. (64 cm)**	**30 in. (76 cm)**
Irradiance $\mu W/cm^2/nm$	17.6	12.1	7.3
Effective area (diameter)	5.7 in. (14 cm)	7.5 in. (19 cm)	9.5 in. (24 cm)

1. Each Olympic Bili-Meter is certified to be calibrated traceable to the United States National Institute of Standards and Technology (NIST).

Table 1.5 Average irradiance using the IEC Standard (400–550 nm)

	Distance from lens to top of light sensor		
	20 in. (51 cm)	**25 in. (64 cm)**	**30 in. (76 cm)**
Irradiance μW/cm²/nm	18.5	11.0	6.4
Effective area (diameter)	5.7 in. (14 cm)	7.5 in. (19 cm)	9.5 in. (24 cm)

Table 1.6 Maximum irradiance using the IEC Standard (400–550 nm)

	Distance from lens to top of light sensor		
	20 in. (51 cm)	**25 in. (64 cm)**	**30 in. (76 cm)**
Irradiance μW/cm²/nm	23.2	16.0	9.7
Effective area (diameter)	5.7 in. (14 cm)	7.5 in. (19 cm)	9.5 in. (24 cm)

Figure 1.4 Response, Olympic Bili-Meter

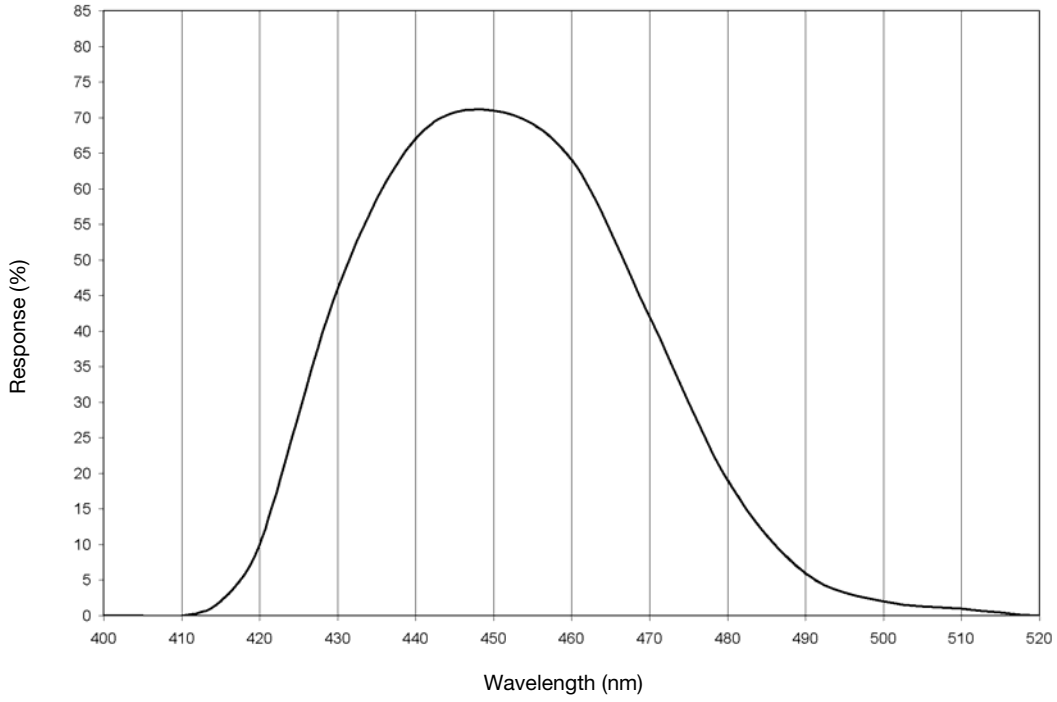


Figure 1.5 Spectral energy distribution, halogen bulb

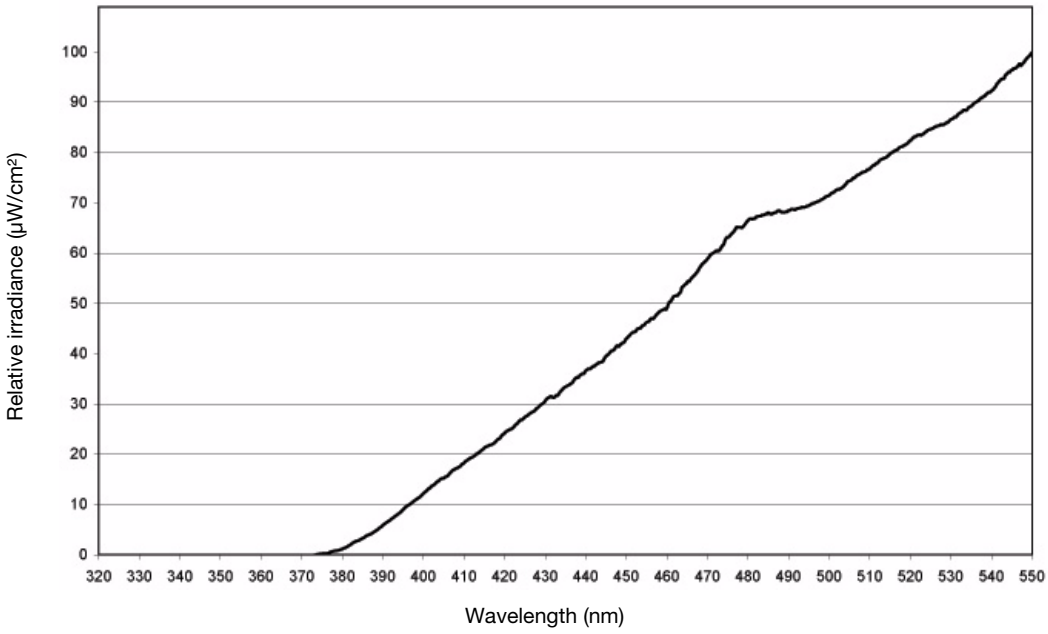
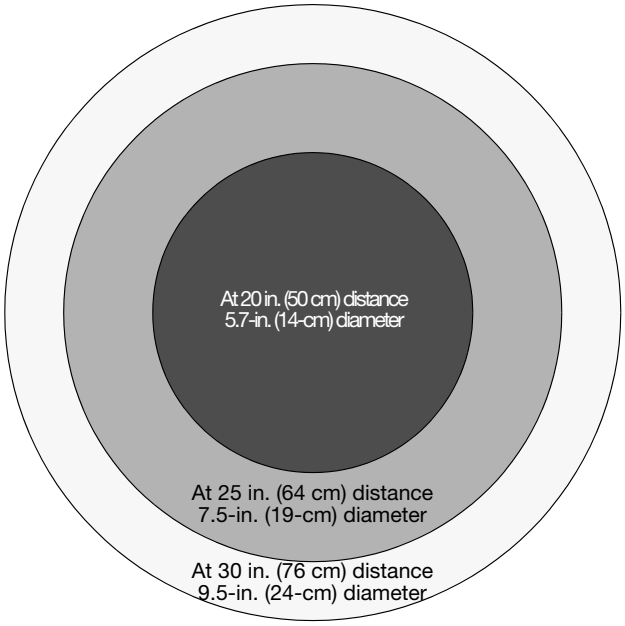


Figure 1.6 Effective surface area, Olympic Bili-Lite Model 80/81


At 20 in. (50 cm) distance
5.7-in. (14-cm) diameter
At 25 in. (64 cm) distance
7.5-in. (19-cm) diameter
At 30 in. (76 cm) distance
9.5-in. (24-cm) diameter

NOTE Effective surface area shown directly overhead. If the lamp is angled toward the patient, the effective area will elongate proportionately to the angle.

Section

2

Assembly

> **CAUTION**
> - Only qualified technicians should assemble this device.
> - Read and be familiar with this instruction manual before assembling this device.

Assembling the Bili-Lite

The Bili-Lite is shipped with the following:

- Arm assembly, with bulb installed
- Support post
- Base
- Caster wheels with hardware packet

Required Items:

- Assemblies listed above
- Scissors
- Phillips-head screwdriver
- 1/2-in. socket driver

To assemble the Bili-Lite:

1 Install the caster wheels:

   a Place the base with the bottom facing up.

   b Screw the casters into the base, then tighten.

> **WARNING**
> **The spring inside the support post is compressed. Releasing the height-adjust knob will permit the support post to extend suddenly and forcefully a distance of 16 in. (40.6 cm). Fully tighten the height-adjust knob before cutting the cable ties that secure the post to the arm. To adjust the height, securely hold the support post while loosening the height-adjust knob.**

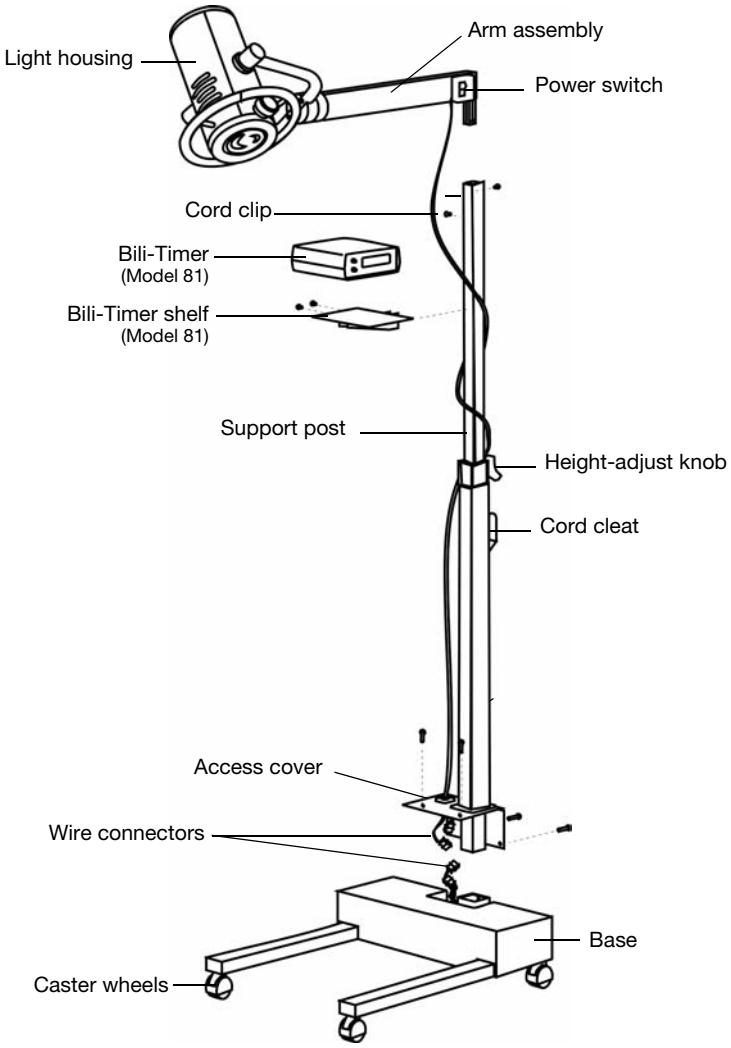
2 Fully tighten the height-adjust knob on the support post, then cut the cable ties that secure the post to the arm (see Figure 2.1).

3 Secure the arm assembly (see Figure 2.1):

   a Without twisting the power cord, place the stub of the arm assembly into the upper support post with the holes aligned.

b Secure with the two 8-32 x 3/8 in. screws.

Figure 2.1 Assembling the Bili-Lite (Model 81 shown)



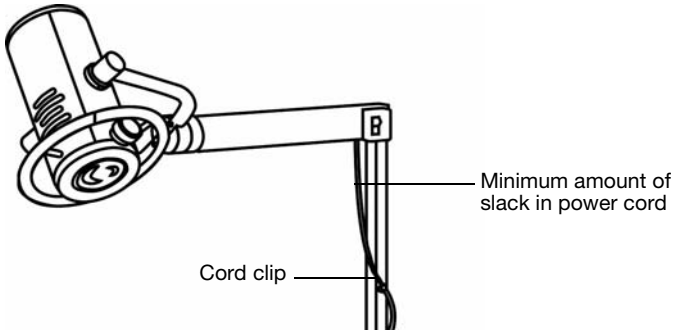
4 Attach the power cord to the support post:

NOTE
- Wrap cord around post as shown in Figure 2.1.
- If assembling a Model 81, skip this step. You will attach the power cord in step 6 on page 2-3.

a Loosen the fastener securing the cord clip to the support post (see Figure 2.1).

b Place the power cord in the cord clip. Allow as minimum amount of cord slack as possible between the clip and the arm assembly (see Figure 2.2), then retighten the fastener.

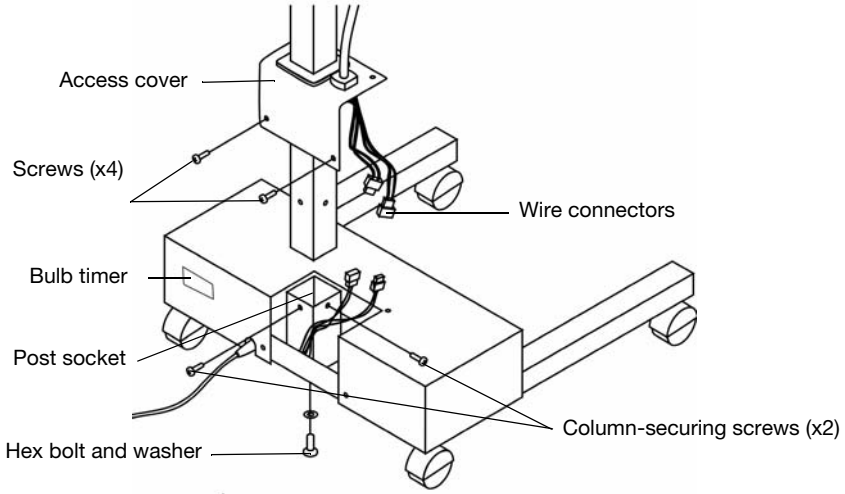
Figure 2.2 Positioning the power cord



5 Assemble the base:

a Set the base on a level surface, then slide the access cover up the lower support post about 6 in. (15.2 cm) (see Figure 2.3).

Figure 2.3 Assembling the post and base



b Loosen the two column-securing screws in the post socket on the base (see Figure 2.3), then insert the support post into the post socket and tighten the screws.

c Insert the hex bolt and washer through the bottom of the base and into the support post (see Figure 2.3), then use the socket driver to securely tighten the bolt.

d Plug the wire connectors from the bottom of the support post into the wires in the base, male to female.

CAUTION Grounding integrity is dependent on proper assembly and tightening of all bolts and screws.

e Attach the access cover to the base cover with the four screws and lock washers. Use care not to pinch the wiring between the access cover and base cover.

6 If assembling a Model 81, attach the Bili-Timer:

a Remove the cord clip fastener.

b Attach the Bili-Timer shelf with two flathead screws (see Figure 2.1 on page 2-2) using one of the screws to reattach the cord clip fastener.

c Place the power cord in the cord clip. Allow as minimum amount of cord slack as possible between the clip and the arm assembly (see Figure 2.2 on page 2-3), then retighten the fastener.

d Place the Bili-Timer on the shelf and plug it into the connector next to the power switch.

7 Test for proper operation (see page 2-5).

Testing the Bili-Lite

Perform the test procedure to ensure the Bili-Lite is working properly after performing assembly and service procedures.

To test the Bili-Lite:

1. Plug in the power cord, then press the power switch to the **ON** (|) position.
2. Confirm the following:
   - The bulbs illuminate.
   - The fan is on and air is flowing from the end of the bulb housing.
3. Check the bulb timer:
   a. Turn off the Bili-Lite.
   b. Check the number on the bulb timer (see Figure 2.3).
   c. Turn on the Bili-Lite, wait six minutes, then turn off the Bili-Lite.
   d. Check the number on the bulb timer. Verify that the timer has progressed 0.1 hours.
4. Test the Bili-Timer (Model 81):
   a. With the phototherapy lamp off, press **POWER** to turn on the Bili-Timer. Confirm that the display shows 000.0, and the colon remains steady (i.e., is not blinking).
   b. Turn on the phototherapy light. Confirm that the colon blinks and, after approximately six minutes, the display shows 000.1 (i.e., one-tenth of an hour).
   c. Press **ZERO**. Confirm that the display shows 000.0.
   d. Press **POWER** to turn off the Bili-Timer.
5. Move the light housing to several positions—vertical and rotational; verify that it remains at each set position.
6. Press the power switch to the **OFF** (O) position to turn off the Bili-Lite.

NOTE If the device does not operate as expected, see *Troubleshooting* on page 5-1.

Section

3

Operation

WARNING **Explosion hazard. Do not use this device in the presence of flammables (e.g., oxygen, nitrous oxide, anesthetics).**

CAUTION

- Read and be familiar with this instruction manual before using this device.
- Only use this device under the direct supervision of a licensed medical practitioner.
- Connect this device directly to a properly grounded hospital-grade outlet.
- Do not place anything on top of light housing or attach anything to device that adds weight as this will degrade stability.
- Always lock wheel casters to maintain the correct light position over the patient.
- During phototherapy treatment cover the patient's eyes with an opaque mask, such as an Olympic Bili-Mask (see Figure 1.3 on page 1-4).
- Place the bottom of the Bili-Lite light housing at least 20 in. (50.8 cm) from the patient to avoid overheating the patient and to avoid ultraviolet and infrared exposure.
- Place the bottom of the Bili-Lite light housing at least 3 in. (7.6 cm) from the top of the incubator to avoid overheating the patient.
- If used with a radiant warmer, do not place the light housing under the canopy of the radiant warmer.
- Never position the phototherapy light so that the Olympic Bili-Timer is under a radiant warmer or heat lamp.
- Observe patient frequently for adverse reactions during phototherapy.
- Monitor the patient's water balance during treatment as it may be affected by phototherapy.
- Monitor the patient's temperature during treatment because phototherapy may affect patient body temperature.
- Do not use reflective foils because they may cause hazardous body temperatures.
- Patients adjacent to the phototherapy equipment may require eye protection or shielding from phototherapy radiation.
- Phototherapy treatment may affect the heat supply of thermotherapy devices (incubators, radiant warmers, and heated mattresses). Use of skin-controlled mode is recommended for thermotherapy devices used in conjunction with phototherapy devices. If skin controlled mode is not used, the air temperature setting or heat output may need to be reduced during phototherapy treatment.
- Measure the bilirubin level at regular intervals during treatment.
- Photo isomers of bilirubin may cause toxic effects.
- Operators may experience some adverse effects from exposure to phototherapy irradiation.
- Do not store drugs and infusion liquids in the phototherapy radiation area.

NOTE The hospital/facility is responsible for ensuring that all personnel who operate or maintain this device are trained in its operation and safe use and for maintaining training records of attendance and evidence of understanding.

Operating the Bili-Lite

To operate the Bili-Lite:

1 Plug in the power cord, then press the power switch to the **ON** (|) position.

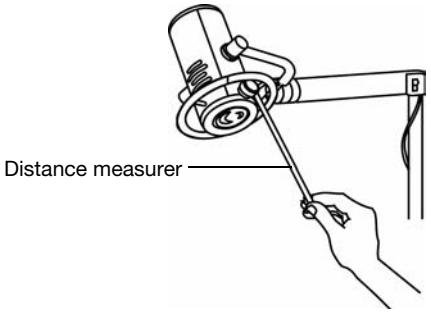
2 Position the Bili-Lite so the maximum light (irradiance) is delivered to the patient's exposed skin area:

- Reposition the lamp position via its caster wheels
- Raise and lower the light
- Position the light housing—vertically and rotationally

CAUTION
- Place the bottom of the Bili-Lite light housing at least 20 in. (50.8 cm) from the patient to avoid overheating the patient and to avoid ultraviolet and infrared exposure.
- Place the bottom of the Bili-Lite light housing at least 3 in. (7.6 cm) from the top of the incubator to avoid overheating the patient.

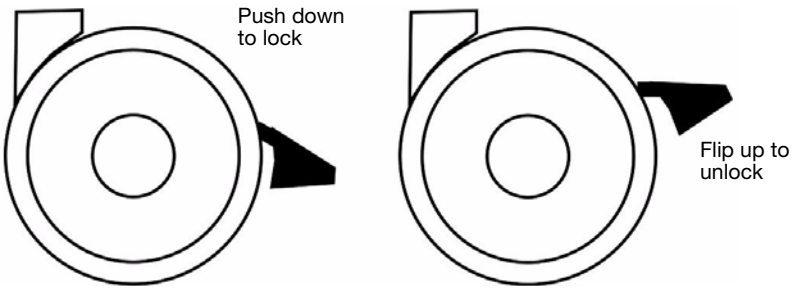
3 Using the distance measurer, which is mounted on the light housing (see Figure 3.1), accurately measure the distance from the bulb to the infant. The distance measurer retracts automatically.

Figure 3.1 Using the distance measurer



4 Lock the casters to maintain the correct position over the patient.

Figure 3.2 Locking the caster wheels



Positioning the Light

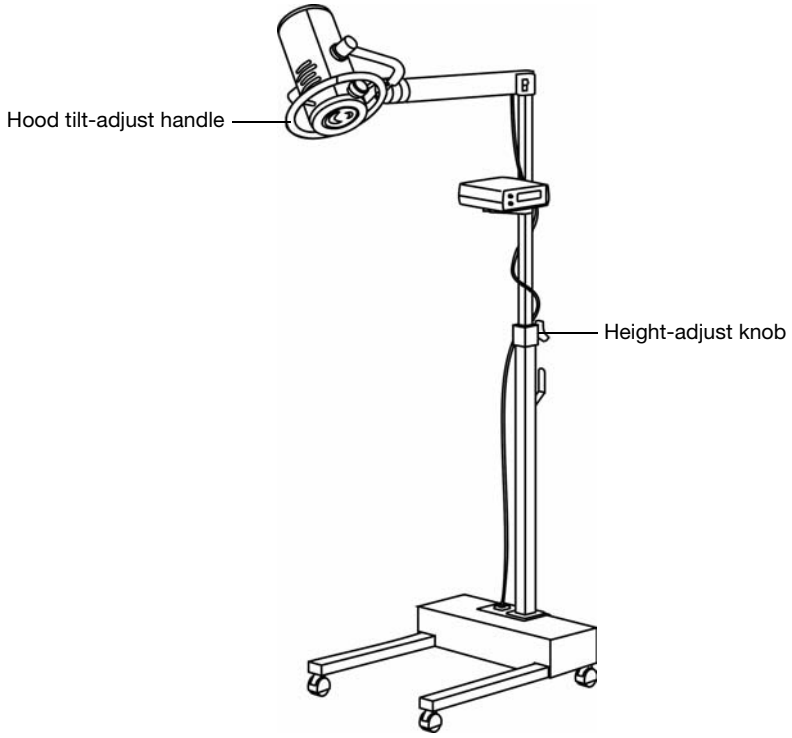
To raise or lower the light:

- Loosen the height-adjust knob (see Figure 3.3). Next, move the light housing to the desired height, then tighten the knob.

To tilt the light:

- Grasp a hood tilt-adjust handle (see Figure 3.3) and move the light housing to any position—vertical and rotational.

Figure 3.3 Adjusting the Bili-Lite



Measuring Irradiance

Irradiance can only be determined by measuring with a radiometer, such as the Olympic Bili-Meter (see page 1-4 and refer to the *Olympic Bili-Meter Model 22 Instruction Manual*).

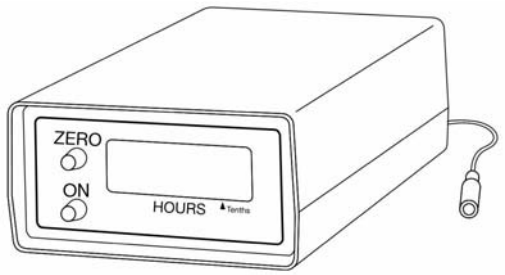
Measuring Treatment Time

The Model 81 is equipped with an Olympic Bili-Timer for measuring the duration of treatment. A photosensor located in the light housing automatically starts the timer when the phototherapy light is turned on. When the light is turned off again, the timing automatically stops.

To measure treatment time:

1 Turn on the Bili-Timer by pressing the **ON** button (see Figure 3.4). The display shows [: 000.0] and the colon remains steady (i.e., doesn't flash).

Figure 3.4 Olympic Bili-Timer



NOTE

- The colon will only flash when the phototherapy light is on. A flashing colon means the timer is timing.
- The Bili-Timer measures time in increments of 0.1 hour (i.e., six minutes).
- If an infant is temporarily removed from under the light, turn off the light to automatically pause the timer. The Bili-Timer will automatically resume timing when the light is turned on.

2 When the infant is placed under the light, press **ZERO**. Verify the time resets to 000.0.

3 When phototherapy treatment is complete, turn off the phototherapy light. The Bili-Timer automatically stops timing. Record the displayed timer value; the time remains on display until **ZERO** is pressed or the Bili-Timer is turned off.

4 When placing a new infant under the light, press **ZERO** to reset the Bili-Timer.

Section

4

Maintenance

WARNING

- **Electrical shock hazard when the enclosure is open. Unplug the power cord from the electrical outlet before cleaning this device.**
- **Do not clean this device with flammable solutions (e.g., antiseptics, cleaning agents).**

CAUTION

- Only qualified personnel should perform maintenance procedures.
- Do not allow liquid to enter the light housing as liquids may cause a shock hazard or damage the internal wiring.

Cleaning the Bili-Lite

Required Items:

- Cleaning cloths
- Lint-free cloth
- Mild cleaning detergent (e.g., Virex™ Tb, Virustat®, Coverage®) or soap-and-water solution
- Alcohol

To clean the Bili-Lite:

1. Press the power switch to the **OFF** (O) position, then unlug the power cord. Allow the light to cool to touch before cleaning.
2. Dampen the cleaning cloth with either the mild soap-and-water solution or the liquid disinfectant, then wipe down all exterior surfaces of the Bili-Lite, including the power cord. Use the second cloth to dry all exterior surfaces of the Bili-Lite.

Cleaning the Bulb

Periodically clean the bulb and the interior of the bulb housing of accumulated dust to maintain fan efficiency and prolong bulb life.

> **CAUTION** Keep the halogen bulb and the inside surface of the bulb reflector clean. Dust, foreign particles, or body oils on the bulb's surface will cause hot spots that can result in bulb breakage.

Required Items:

- Soft lint-free cloth
- Soft brush
- Alcohol

To clean the bulb and its housing:

1. Remove the bulb (see page 4-3), wipe the bulb and its housing clean with alcohol and a lint-free cloth to remove any fingerprints or dust, then reinstall the bulb.
2. Using a soft brush, gently sweep any dust from the lamp housing interior and its components.

Cleaning the Bili-Timer (Model 81)

> **NOTE** Only use mild cleaning detergents; other cleaning agents may damage the exterior of the Bili-Timer. Dilute cleaning agents according to their label instructions. Use of improper cleaners (e.g., corrosives) will void the warranty.

Required Items:

- Soft cloth
- Mild cleaning detergent (e.g., Virex™ Tb, Virustat®, Coverage®) or mild soap-and-water solution

To clean the Bili-Timer:

1. Confirm that the Bili-Timer is off. If it is on, press **POWER** to turn it off.
2. Dampen the cloth with either the mild soap-and-water solution or detergent, then wipe down all exterior surfaces of the Bili-Timer.

Replacing the Bulb

Replace the Bili-Lite bulbs at 500 hours to maintain greater than 75% of initial irradiance.

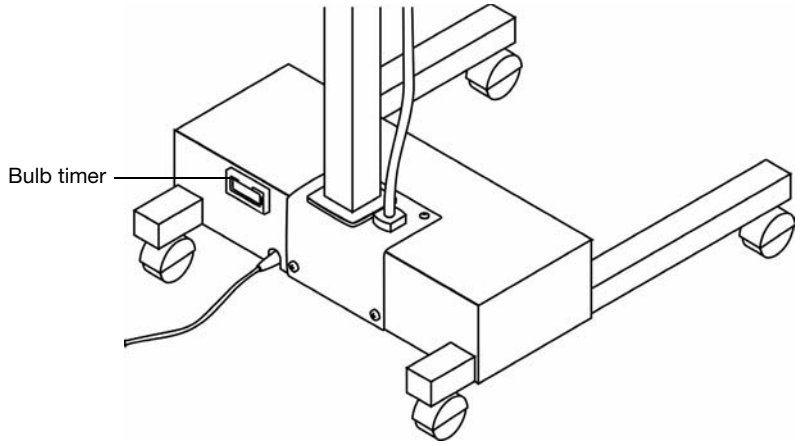
Bulb Timer

The bulb timer (see Figure 4.1) operates whenever the bulb illuminates. View the elapsed time shown to track bulb life and determine when to replace the treatment bulb.

NOTE

- The ***elapsed time*** bulb timer cannot be reset by the user.
- The bulb timer may be labeled as ***Lamp Timer***.
- Record the bulb change in the *Medical Device History*.

Figure 4.1 Location of bulb timer



WARNING **Electrical shock hazard when the enclosure is open. Unplug the power cord from the electrical outlet before replacing the bulb.**

CAUTION

- Only use bulbs specified by Olympic Medical. Use of other bulbs may affect the safety and efficacy of treatment.
- The halogen bulb gets extremely hot. If the light has been on, allow it to cool for 15 minutes before attempting to remove it.

NOTE

- Route all the wiring away from the bulb and its assembly.
- Do not touch the bulb or the inside surface of the bulb reflector. Dust, foreign particles, or body oils on the bulb's surface will cause hot spots that can result in bulb breakage.
- The halogen bulb maintains ±25% of the initial irradiance throughout the bulb life. Bulb life is approximately 500 hours.

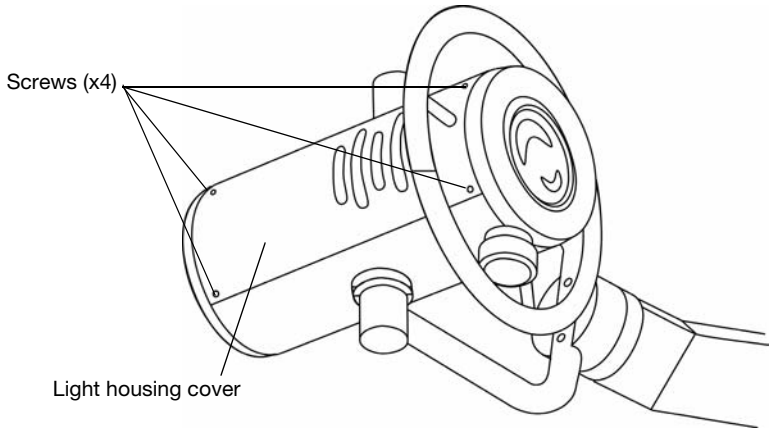
Required Items:

- Bulb (part no. 51408)
- Phillips-head screwdriver

To replace the bulb:

1 Remove the four screws and washers in the upper cover of the light housing (see Figure 4.2), then remove the light housing cover.

Figure 4.2 Removing the cover



2 Lift the bulb and white ceramic socket straight up, out of the light housing.

3 Remove the bulb from the socket.

4 Insert the new bulb by aligning bulb pins with the ceramic socket then pushing the socket toward the bulb.

5 Slide the bulb and socket fully into the holder bracket under the spring wires.

6 Place the light housing cover and secure the screws.

7 Test for proper operation (see page 2-5)

Replacing the Battery (Bili-Timer)

Batteries will last up to 300 days (7,200 hours) of continuous use. With intermittent use, the batteries can last up to two years.

NOTE
- Always remove the batteries before storing the Bili-Lite.
- Always replace all four batteries at the same time.

LOW BAT Signal

The **LOW BAT** signal displays on the Bili-Timer when the batteries need replacing. When it first appears, approximately 100 hours of battery life remain. If **LOW BAT** displays during treatment, replace the batteries immediately after treatment is complete.

Required items:

- Four AA-alkaline batteries

To install the batteries:

1. Remove the Bili-Timer from its shelf on the support post of the Model 81.
2. Slide the battery cover off of the back of the Bili-Lite, then remove the old batteries.
3. Insert the new batteries; follow the battery polarity indicators on the cover.
4. Slide the battery cover back onto the Bili-Lite.
5. Place the Bili-Timer on its shelf on the support post of the Model 81.

Section

5

Troubleshooting

Should you experience difficulty when operating your Olympic Bili-Lite, consult the following table. For problems not listed in the table, contact Olympic Medical (see *Technical Support* on page 5-2).

Table 5.1 Troubleshooting chart

Problem	Probable Cause	Solution
■ Power **ON** (|) ■ Bulb not lit ■ Fan doesn't run	No power	Make sure the power cord is plugged in.
		Check the external circuit breakers.
	Internal 5A fuse blown (hot and neutral lines both fused)	Replace the 5A fuses (see page 6-6).
	Tripped thermal protector	Wait 15 minutes, then press the red reset button (see page 6-2). If the device trips repeatedly, the fan motor is beginning to fail. Replace fan (see page 6-4).
	Damaged power switch	Check the power switch; replace if necessary (see page 6-11).
	Break in wiring	Check the wiring. Confirm that all connectors are properly seated.
	Damaged transformer	Check the toroidal transformer; replace if necessary (see page 6-9).
	Fuse block damaged	Replace the fuse block (see page 6-8).
■ Power **ON** (|) ■ Bulb not lit ■ Fan runs	Burned out bulb	Replace the bulb (see page 4-3).
	Bulb socket worn and discolored from arcing	Replace the socket (see page 6-13).
■ Power **ON** (|) ■ Bulb lights ■ Fan doesn't run	Jammed fan	Inspect the blades and make sure fan turns freely (see page 6-4).
	Loose fan blades	Tighten the fan blades on the motor shaft (see page 6-4).
	Damaged fan motor	Replace the fan (see page 6-4).
Thermal protector trips repeatedly	Damaged fan (weak or stopped)	Replace the fan (see page 6-4).
	Blocked cooling vents	■ Clean the vents. ■ Keep items away from the vents to ensure proper air flow.
	Dusty bulb housing	Clean the bulb housing interior (see page 4-2).

Table 5.1 Troubleshooting chart, continued

Problem	Probable Cause	Solution
Thermal protector won't reset	Damaged thermal protector	Replace thermal protector (see page 6-3).
Model 81: No display on Bili-Timer	Bili-Timer off	Press **POWER** to turn on the Bili-Timer.
	Low batteries	Replace the batteries (see page 4-5).
Model 81: Colon doesn't flash when the phototherapy lamp is on	Sensor failure	The photosensor may need to be replaced; contact Olympic Medical.

Technical Support

For technical support, contact Olympic Medical at:
Toll-free: 1-800-426-0353 (US/Canada)
Phone: 206-767-3500 (worldwide)
Fax: 206-762-4200

Section

6

Service

WARNING **Electrical shock hazard when the enclosure is open. Unplug the power cord from the electrical outlet before servicing this device.**

CAUTION

- Only qualified technicians should perform service procedures.
- Reattach all ground wires after servicing to ensure proper grounding.
- Note the location of the lock washers when disassembling the device. To ensure ground integrity, reseat all washers when reassembling the device.
- Do not allow liquids to enter bulb enclosure as this may result in a shock hazard or damage internal wiring.
- Firmly tighten the height-adjust knob before attempting to remove the light housing.

NOTE The Bili-Timer (Model 81) has no customer-serviceable parts; return to Olympic Medical for service.

Repair Policy

Do not use malfunctioning equipment. To promote product reliability, a qualified technician may perform the replacement and service procedures described in this section. Before servicing your equipment, check your equipment warranty status, check the normal repair procedures for your facility, and determine the appropriate repair procedure to perform.

To ensure performance to factory specifications, it is recommended that all replacement parts be those either manufactured or sold by Olympic Medical. After all repairs are complete, perform the pre-operative test procedure (see page 2-5) to ensure proper operation and compliance with published specifications.

Repair Procedures

Consult the troubleshooting table (page 5-1) to identify probable cause and its solution before performing the repair procedure.

WARNING **Electrical shock hazard when the enclosure is open. Unplug the power cord from the electrical outlet before servicing this device.**

CAUTION

- Reattach all ground wires after servicing to ensure proper grounding.
- Note the location of the lock washers when disassembling the device. To ensure ground integrity, reseat all washers when reassembling the device.
- Do not allow liquids to enter bulb enclosure as this may result in a shock hazard or damage internal wiring.
- Firmly tighten the height-adjust knob before attempting to remove the light housing.

Resetting the Thermal Protector

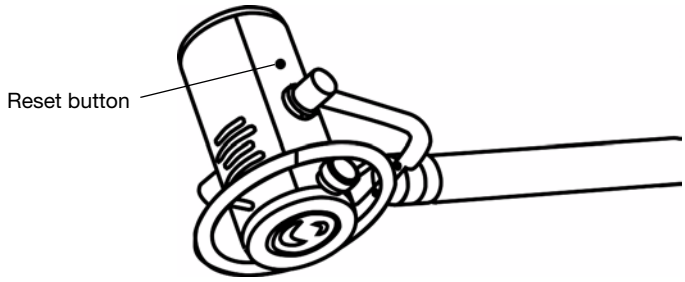
If the interior of the bulb housing gets too hot, the thermal protector will trip and must be reset.

To reset the thermal protector:

1 Press the power switch to the **OFF** (O) position to turn off the Bili-Lite.

2 The thermal protector is located inside the bulb housing with its red reset button protruding to the outside of the housing (Figure 6.1). Press the reset button located on the hood.

Figure 6.1 Location of reset button



3 Test for proper operation (see page 2-5).

Replacing the Thermal Protector

If the thermal protector cannot be reset, replace it.

Required Items:

- Thermal protector assembly (part no. 401147)
- Phillips-head screwdriver

To replace the thermal protector:

> **CAUTION**
> - The halogen bulb gets extremely hot. If the light has been on, allow to cool for 15 minutes before performing this procedure.
> - Before removing the light housings, firmly tighten the height adjustment control knob.

1. Press the power switch to the **OFF** (O) position, then unplug the power cord.
2. Remove the four screws in the upper cover of the light housing. Remove the upper cover.
3. Remove the quick disconnects from the old thermal protector.
4. Remove the old thermal protector.
5. Insert the replacement thermal protector.
6. Attach the quick disconnects to the replacement thermal protector.
7. Place the upper cover in place and secure with the four screws.

Replacing the Fan

If the fan motor malfunctions, replace the fan.

Required Items:

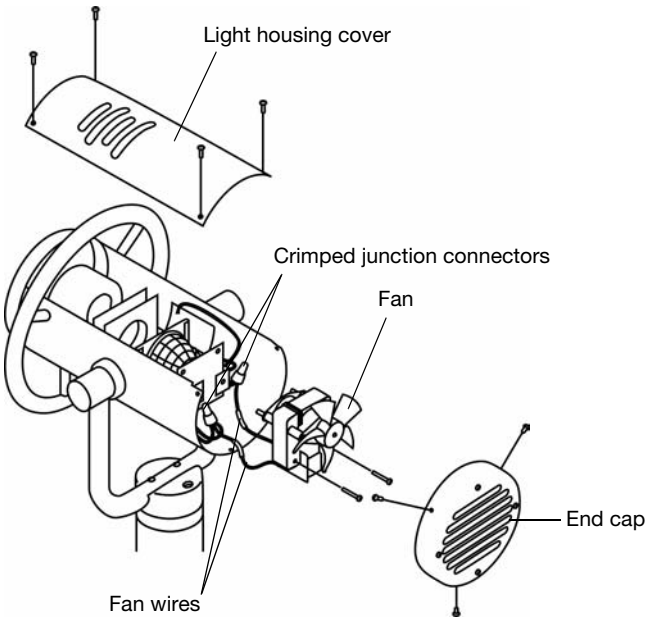
- Fan (part no. 200195)
- Phillips-head screwdriver
- Wire cutter/stripper

To replace the fan:

> **CAUTION** The halogen bulb gets extremely hot. If the light has been on, allow to cool for 15 minutes before performing this procedure.

1. Press the power switch to the **OFF** (O) position, then unplug the power cord.
2. Remove the four screws and washers from the light housing cover, then remove the cover (see Figure 6.2).
3. Remove the three screws and washers that secure the end cap to the light housing (see Figure 6.2), then remove the end cap.

Figure 6.2 Removing the fan



4. Cut the fan wires approximately 1-1/2 in. (3.8 cm) from the crimped junction connectors.
5. Unscrew the two Phillips-head screws that secure the fan, then remove the fan.
6. Trim the wires of the new fan to a length of 1-1/2 in. (3.8 cm).
7. Butt-splice the wires of the new fan to the wires of the bulb socket.
8. Secure the new fan with the two Phillips-head screws.

9 Arrange the wires away of the fan blades.

10 Reattach the end cap with its washers and screws.

11 Reattach the light housing cover with its washers and screws.

12 Test for proper operation (see page 2-5).

Replacing the Fuses

If the bulb does not illuminate when the power is connected and the lamp is turned on, a fuse may be blown.

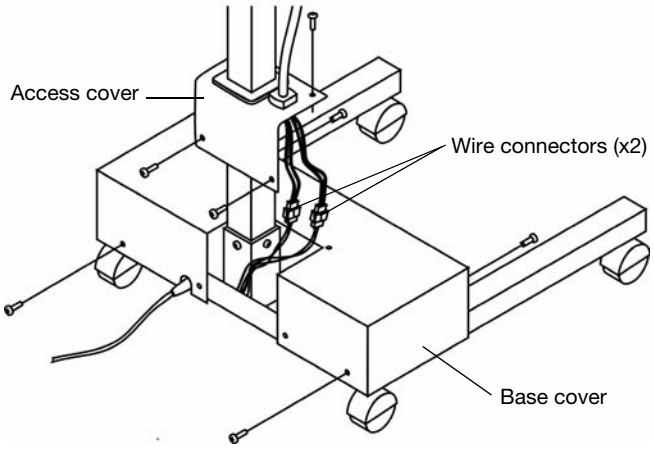
Required Items:

- Fuse (part no. 200021)
- Phillips-head screwdriver

To replace the fuse:

1. Press the power switch to the **OFF** (O) position, then unplug the power cord.
2. Remove the four screws and lock washers that secure the access cover to the base cover, then slide the access cover up the support post a few inches (see Figure 6.3).
3. Disconnect the two wire connectors at the bottom of the support post from the wires in the base.
4. Remove the four screws and washers that secure the base cover, then remove the base cover (see Figure 6.3). Carefully set the base to the side, while taking care not to pull the bulb timer wires loose.

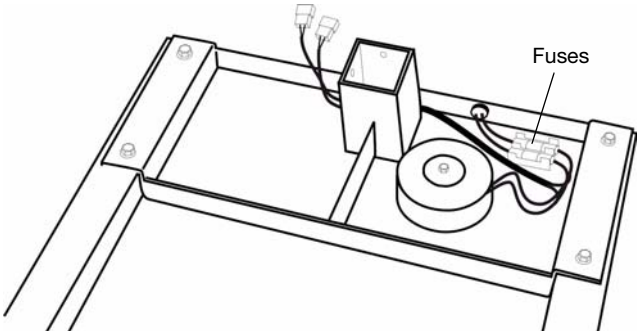
Figure 6.3 Removing the access cover



CAUTION For protection against fire hazard, replace only with the correct type and rating of fuse.

5. Remove and replace fuses (see Figure 6.4).

Figure 6.4 Replacing the fuses



6 Reattach the base cover, place the washers, then tighten the four screws.

7 Reconnect the two wire connectors from the bottom of the support post into the wires in the base, male to female.

8 Slide the access cover down the support post, then secure the access cover to the base cover with four screws and lock washers.

9 Test for proper operation (see page 2-5).

Replacing the Fuse Block

If the power switch is on, but the bulb doesn't light and the fan doesn't run, the fuse block may need to be replaced.

Required Items:

- Fuse block (part no. 200128)
- Medium-sized Phillips-head screwdriver
- 5-16 in. nutdriver

To replace the fuse block:

1. Press the power switch to the **OFF** (O) position, then unplug the power cord.
2. Remove the four screws and lock washers that secure the access cover to the base cover, then slide the access cover up the support post a few inches (see Figure 6.3).
3. Disconnect the two wire connectors at the bottom of the support post from the wires in the base, male from female.
4. Remove the four screws and washers that secure the base cover, then remove the base cover (see Figure 6.3).
5. Remove the fuse from the damaged fuse block (see Figure 6.4).
6. Loosen and remove the Phillips-head screw, washer, and acorn nut.
7. Disconnect the two wire connectors, and remove the damaged fuse block.
8. Reconnect the two wire connectors to the new fuse block (see the Wiring Diagram, page A-1).
9. Assemble the new fuse block using the Phillips-head screw, washer, and acorn nut.

> ⚠ **CAUTION** For protection against a fire hazard, replace only with the correct type and rating of fuse.

10. Replace the fuse (see Figure 6.4).
11. Reattach the base cover, place the washers, then tighten the four screws.
12. Reconnect the two wire connectors from the bottom of the support post into the wires in the base, male to female.
13. Slide the access cover down the support post, then secure the access cover to the base cover with four screws and lock washers.
14. Test for proper operation (see page 2-5).

Replacing the Toroidal Transformer

If the power switch is on, but the bulb and fan do not run, the toroidal transformer may need to be replaced.

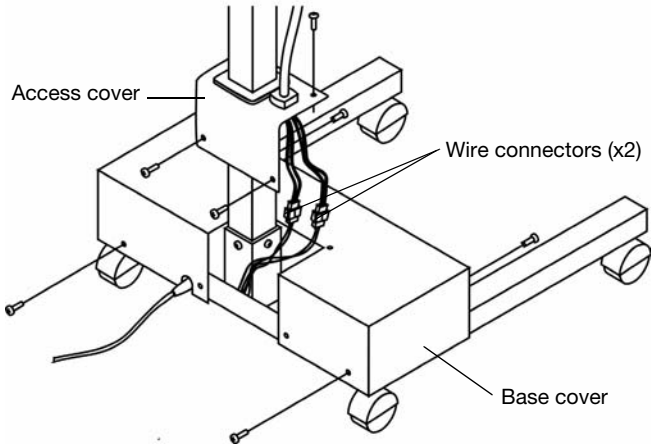
Required Items:

- Toroidal transformer (part no. 401116)
- Phillips-head screwdriver
- 1/4-in. nut driver
- Small cable ties (x5)

To replace the toroidal transformer:

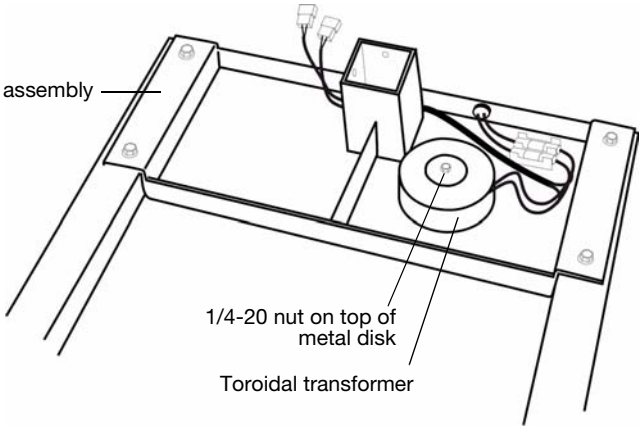
1. Press the power switch to the **OFF** (O) position, then unplug the power cord.
2. Remove the four screws and lock washers that secure the access cover to the base cover, then slide the access cover up the support post a few inches (see Figure 6.5)
3. Disconnect the two wire connectors at the bottom of the support post from the wires in the base, male from female.
4. Remove the four screws and washers that secure the base cover, then remove the base cover (see Figure 6.5).

Figure 6.5 Accessing the toroidal transformer



5. Disconnect the wiring and terminals:
   a. Observe and note the wire routing.
   b. Cut and remove all cable tie mounts except the one near the power cord inlet.
   c. Remove all terminals except wires #1, 2, and 4 (power cord) and the ground wire.
6. Locate and remove the toroidal transformer (see Figure 6.6):
   a. Loosen and remove nut and screw from the metal disk on top of the toroidal transformer. You may to need to hold the hex-head screw in place from under the base assembly of the Bili-Lite while loosening the nut.
   b. Remove the damaged toroidal transformer and the two rubber gaskets.

Figure 6.6 Removing the toroidal transformer



7 Install the new toroidal transformer:

NOTE Center the new toroidal transformer assembly over the screw hole in the base assembly.

- **a** Place the rubber gasket centered over the screw hole of the base assembly
- **b** Place the toroidal transformer on top of the rubber gasket.
- **c** Place the second rubber gasket on top of the toroidal transformer.
- **d** Place the metal disk over the rubber gasket, with the raised center side facing down.
- **e** Push the hex-head screw up through bottom of the base assembly through the first gasket, toroidal transformer, second gasket, and metal plate.
- **f** Tighten the hex nut onto the hex-head screw. Continue tightening the nut only until the transformer cannot be rotated by hand.

NOTE Over-tightening the hex nut can damage the transformer assembly.

8 Reconnect the wiring and terminals (see the wiring diagram on page A-1), then reroute and secure the wires using the small cable ties.

9 Reattach the base cover, place the washers, then tighten the four screws.

10 Reconnect the two wire connectors from the bottom of the support post into the wires in the base, male to female.

11 Slide the access cover down the support post, then secure the access cover to the base cover with four screws and lock washers.

12 Test for proper operation (see page 2-5).

Replacing the Power Switch

If the power switch no longer turns on the bulb when in the **ON** (|) position, and a new bulb is in place, the switch may need to be replaced.

Required Items:

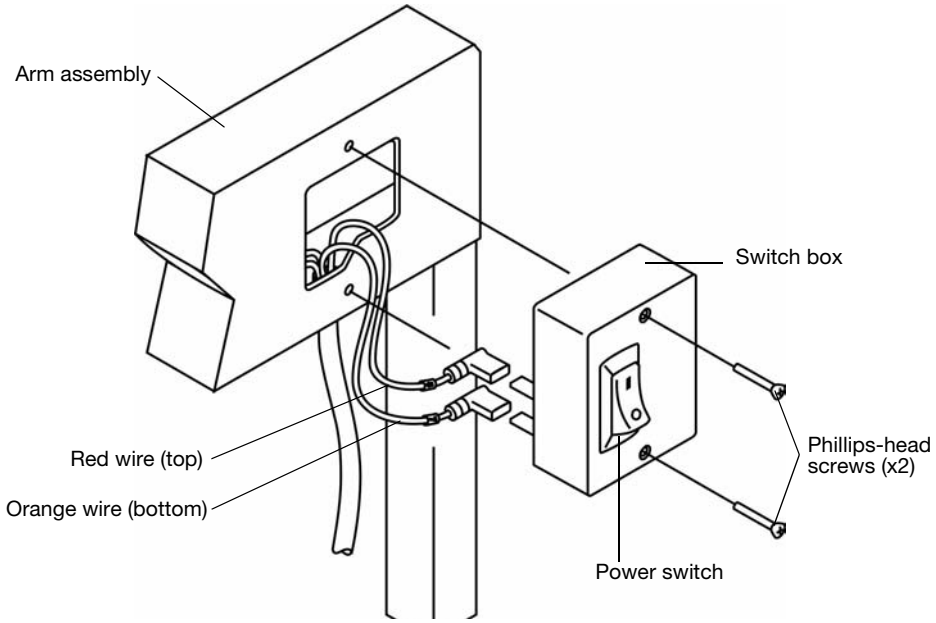
- Power switch (part no. 200001)
- Phillips-head screwdriver

To replace the power switch:

1 Press the power switch to the **OFF** (O) position, then unplug the power cord.

2 Locate and remove the two Phillips-head screws that attach the switch box to the arm assembly (see Figure 6.7).

Figure 6.7 Replacing the power switch, exploded view



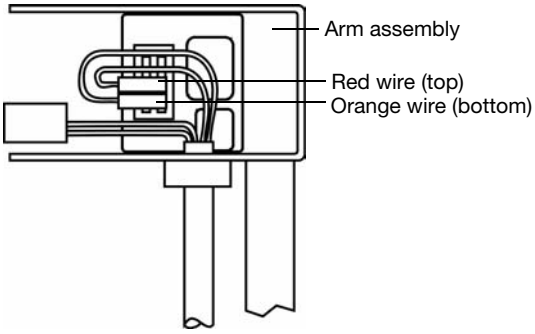
3 Locate and disconnect the red and orange wires from the switch, then remove the switch box.

4 Remove the power switch from the switch box by compressing the small retaining arms until the switch can be pulled free.

5 Install the new switch with the on (|) and off (O) icons oriented as shown in Figure 6.7.

6 Reconnect the wires to their terminals (see Figure 6.7 and Figure 6.8).

Figure 6.8 Power switch wiring, cut away view



7 Reattach the switch box being careful not to pinch the wires, using the two Phillips-head screws.

8 Test for proper operation (see page 2-5).

Replacing the Ceramic Bulb Socket

If the bulb socket is worn or discolored from arcing, replace it.

Required Items:

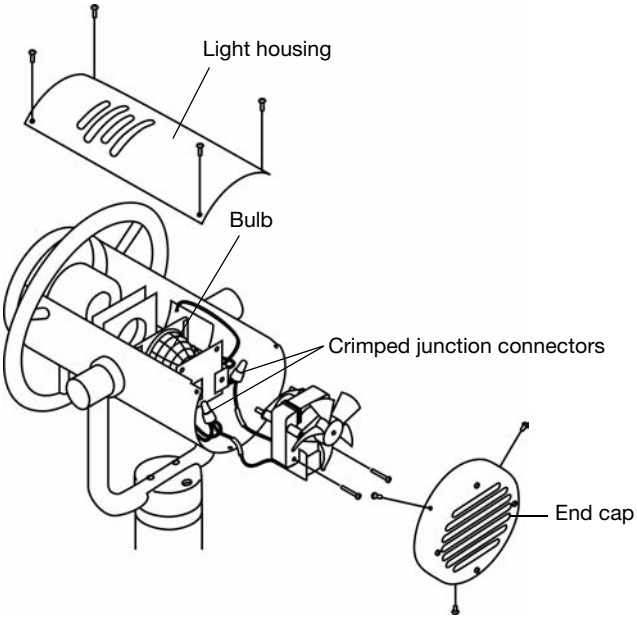
- Ceramic bulb socket
- Medium-size Phillips-head screwdriver
- Small wire cutter/stripper
- Wire crimpers

To replace the ceramic bulb socket:

> **CAUTION** The halogen bulb gets extremely hot. If the light has been on, allow to cool for 15 minutes before performing this procedure.

1. Press the power switch to the **OFF** (O) position, then unplug the power cord.
2. Remove the four screws and washers in the upper cover of the light housing (see Figure 6.9), then remove the light housing cover.
3. Lift the bulb and white ceramic socket straight up, out of the holder bracket (see Figure 6.9).
4. Remove the bulb from the socket.
5. Remove the four screws of the end cap (see Figure 6.9), then remove the end cap.

Figure 6.9 Accessing the bulb socket



6. Remove the crimped junction connectors, which cover the bulb socket wires that are spliced to the fan wires.
7. Remove the wire insulation from the old ceramic bulb socket.

NOTE If necessary, strip the fan wires 1/4 in. (0.6 cm).

8 Slip the wire insulation over the wires of the new ceramic bulb socket, then crimp the wires to the wires for the fan.

9 Replace the end cap, and re-tighten the four screws.

10 Insert the new bulb by aligning the bulb pins with the ceramic socket then pushing the socket toward the bulb.

CAUTION
- Use only bulbs specified by Olympic Medical. Use of other bulbs may affect the safety and efficacy of treatment.
- Do not touch the bulb or the inside surface of the bulb reflector. Dust, foreign particles, or body oils on the bulb's surface will cause hot spots that can result in bulb breakage during use.

NOTE Route all the wiring away from the bulb and its assembly.

11 Slide the bulb and socket fully into the holder bracket under the spring wires.

12 Reattach the light housing cover with its washers and screws.

13 Test for proper operation (see page 2-5).

Returning for Service

When sending equipment to Olympic Medical for service:

1 Clean the device, then securely package it, and its power cord, in the original shipping container, if possible, and include:
   a A letter describing, in detail, the difficulties experienced.
   b All warranty information; include a copy of the invoice or other applicable documentation.
   c Purchase order (PO) number to cover the repair of any device not under warranty.
   d Return address and bill-to information.
   e Contact person (name and telephone number) for operational inquiries.

2 Ship the equipment prepaid to Olympic Medical.

Section

7

Replacement Parts

NOTE Only use Olympic Medical–approved parts with the Bili-Lite.

Ordering Information

To order parts and accessories, contact:

Olympic Medical
Customer Service Department
5900 First Ave S
Seattle, WA 98108 USA

Toll-free: 1-800-426-0353 (US/Canada)
Phone: 206-767-3500 (worldwide)
Fax: 206-762-4200
Web: www.OlympicMedical.com

Parts and Accessories

When ordering, provide the item number to the customer service representative.

Table 7.1 Parts and accessories list

Item Name / Description	Item Number
Bulbs	
Bulb, halogen	51408
Patient Eye Protection	
Bili-Mask, Quick-Stick style, regular size	52440
Bili-Mask, Quick-Stick style, premie size	52430
Bili-Mask, Regular style, regular size	52411
Bili-Mask, Regular style, premie size	52422
Bili-Mask, Easy-On style, regular size	52410
Bili-Mask, Easy-On style, premie size	52420
Repair Parts	
Bulb holder	200018
Bulb holder socket	200018

Table 7.1 Parts and accessories list, continued

Item Name / Description	Item Number
Caster wheels with brakes	100066
Fan	200195
Fuse, 5A	200021
Fuse block	200128
Lens assembly	300687
Power switch	200001
Thermal protector	401147
Toroidal transformer assembly	401116
Accessories	
Bili-Meter with Type B-22 Sensor	53822
Type B-22 Sensor only	53860

Section

8

Specifications

Intended Use

The Olympic Bili-Lite™ Model 80/81 a floorstand phototherapy lamp intended to provide therapeutic irradiance to treat neonatal hyperbilirubinemia.

Model 81: The Olympic Bili-Timer™ is intended to measure total phototherapy treatment time.

Irradiance at 20 in. (51 cm)

- Average: 14.0 ±3.5 µW/cm²/nm
- Maximum: 17.6 ±4.4 µW/cm²/nm

Note: Stated irradiance is measurement of new, burned-in bulbs with an Olympic Bili-Meter™.

Dimensions

Size:
73.5-in. high x 18.3-in. wide x 29.5-in deep
186.7-cm high x 46.5-cm wide x 74.9-cm deep

Weight
- Model 80: 39.5 lb 17.9 kg
- Model 81: 40.0 lb 18.1 kg

Height Adjustment*
46.5–63.0 in. 118–160 cm

*Distance from bottom of light hood to floor.

Electrical

Power Requirements
- Voltage: 120V~
- Consumption: 1.4A
- Frequency (current): 60 Hz

Ground Impedance
Does not exceed 0.13Ω

Fuses
- Two internal 5A 250V 3AG time-delay fuses
- Manual reset thermal protector in bulb housing

Bulbs
Nominal bulb life (for 75% irradiance): 500 hours

Bili-Timer (Model 81)
- Batteries: four 1.5V AA alkaline batteries; battery life up to 300 days (7,200 hours) with continuous use
- Voltage: 6.0V nominal voltage

Environmental

Operating Temperature
65–85°F 18.3–29.4°C

Shipping Temperature
-40–158°F -40–70°C

Storage Temperature
- Model 80: -40–158°F -40–70°C
- Model 81: -4–113°F -20–45°C

Relative Humidity (RH)
- Operating: 10–95%, non-condensing
- Non-operating: 10–100%, condensing

Pressure
0.5–1.0 atm 500–1600 hPa

Altitude (Maximum)
Up to 10,000 ft Up to 3,000 m

Noise

Maximum noise level: 50 dB(A)

Controls

MAINS POWER changes device state on (|) or off (O).

Bili-Timer (Model 81)
- **POWER:** Turns Bili-Timer on or off.
- **ZERO:** Resets the accumulated time to zero.

Display

Hour meter (bulbs): 9,999.9 hours

External Connections

Hospital-grade power cord

Product

Item	Catalog No.
Bili-Lite Model 80	51480
Bili-Lite Model 81 (includes Bili-Timer)	51481

For additional items, see *Parts and Accessories* on page 7-1.

Regulatory, Electrical Safety, and Classifications

- FDA Class II
- Health Canada Class 2
- CSA Class I
- CSA C 22.2 No. 60601-1
- IEC 60601-2-50
- UL 60601.1
- Ordinary Equipment (IPXØ)
- Pollution Degree 2
- Type B Equipment
- Continuous Operation
- Indoor Use Only
- Not suitable for use in the presence of flammable anaesthetic mixtures with air, oxygen, or nitrous oxide

Service

Service can be performed by hospital technicians. Parts are often available on an overnight express basis. See *Ordering Information* on page 7-1 for more information.

The Bili-Timer has no customer-serviceable parts; return to Olympic Medical for service.

Warranty

One-year warranty, includes parts and labor. Bulbs excluded.

Electromagnetic Compatibility

The Bili-Lite and Bili-Timer comply with the requirements of IEC 60601-1-2 (2001). For information, see pages 8-3–8-5.

Product Disposal

Disposal of the Bili-Lite and Bili-Timer does not require any special precautions. Follow local waste disposal regulations.

Electromagnetic Specifications – Manufacturer's Declaration

The Olympic Bili-Lite is intended for use in the electromagnetic environment specified below. The customer or the user of the Bili-Lite should assure that it is used in such an environment.

Table 8.1 Electromagnetic emissions

Emissions Test	Compliance	Electromagnetic Environment — Guidance
Radio Frequency (RF) Emissions CISPR 11	Group 1	The Bili-Lite uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	The Bili-Lite is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Not applicable	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Not applicable	

Table 8.2 Electromagnetic immunity

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment — Guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions, and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 seconds	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 seconds	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Bili-Lite requires continued operation during power mains interruptions, it is recommended that the Bili-Lite be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE U_T is the alternating current (ac) mains voltage prior to the application of the test level.

Table 8.3 Electromagnetic immunity

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment — Guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the Bili-Lite, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	**Recommended separation distance:** $d = 1.2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	10 V/m	$d = 0.35\sqrt{P}$ 80 MHz to 800 MHz $d = 0.70\sqrt{P}$ 800 MHz to 2.5 GHz ...where (*P*) is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and (*d*) is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[1] should be less than the compliance level in each frequency range.[2] Interference may occur in the vicinity of equipment marked with the following symbol:

1. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Bili-Lite is used exceeds the applicable RF compliance level above, the Bili-Lite should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Bili-Lite.
2. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

NOTE

- At 80 MHz and 800 MHz, the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the Bili-Lite

The Bili-Lite is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Bili-Lite can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Bili-Lite as recommended below, according to the maximum output power of the communications equipment.

Table 8.4 Recommended separation distances

Rated maximum output power of transmitter in watts (W)	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 0.35\sqrt{P}$	800 MHz to 2.5 GHz $d = 0.70\sqrt{P}$
0.01	0.12	0.035	0.07
0.1	0.38	0.11	0.22
1	1.2	0.35	0.70
10	3.8	1.1	2.2
100	12.0	3.5	7.0

For transmitters rated at a maximum output power not listed above, the recommended separation distance (*d*) in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where (*P*) is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE

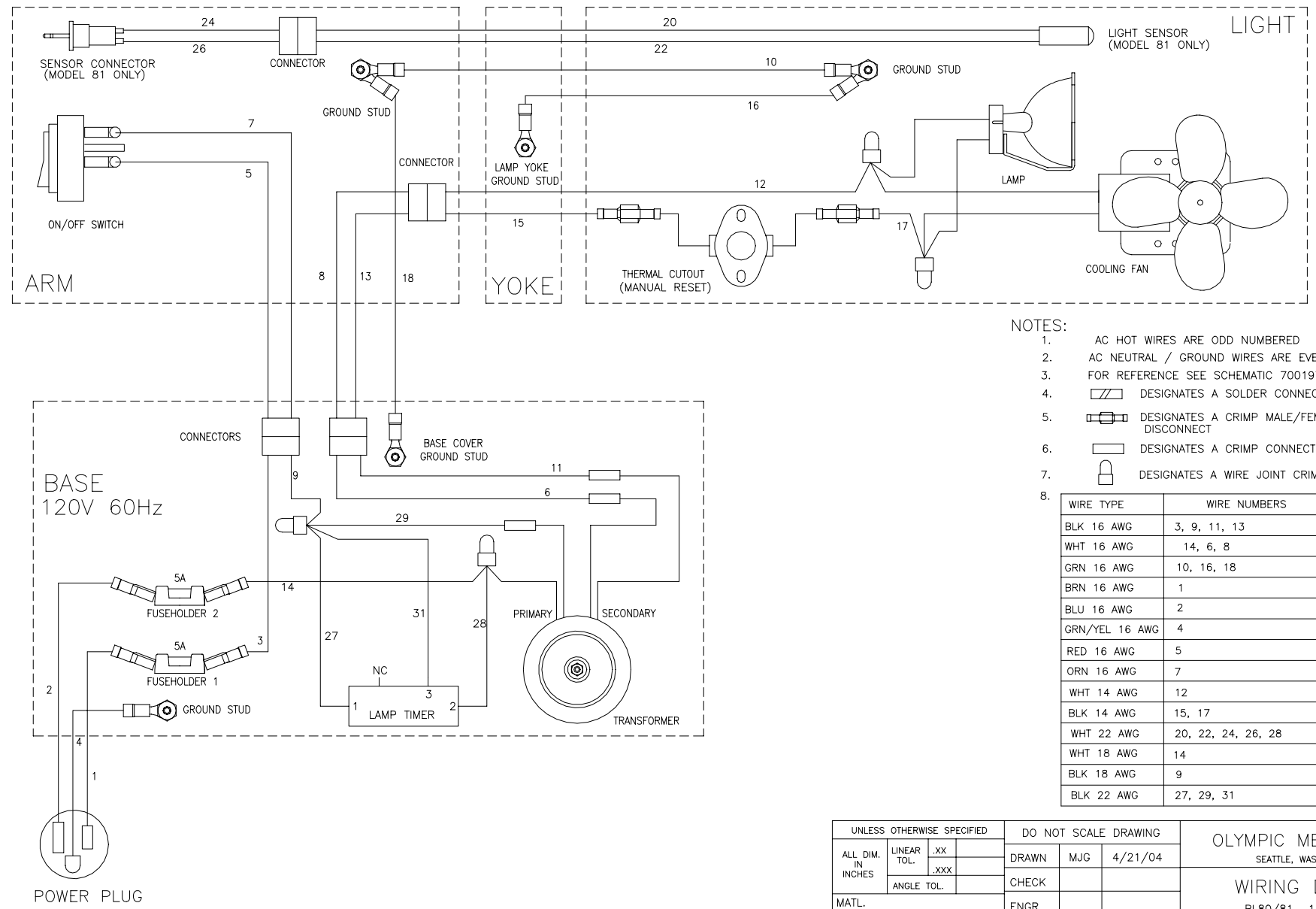
- At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

Drawings and Schematics

Figure A.1 Bili-Lite, Model 80/81 — Wiring Diagram, Drawing No. 700243, Rev. –

THIS DRAWING AND SPECIFICATIONS HEREIN, ARE THE PROPERTY OF THE OLYMPIC MEDICAL CORP. AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.

REVISIONS				
LTR	DESCRIPTION	ECN	DATE	APPROVAL
–	PRODUCTION RELEASE			



NOTES:

1. AC HOT WIRES ARE ODD NUMBERED
2. AC NEUTRAL / GROUND WIRES ARE EVEN NUMBERED
3. FOR REFERENCE SEE SCHEMATIC 700197
4. DESIGNATES A SOLDER CONNECTION
5. DESIGNATES A CRIMP MALE/FEMALE DISCONNECT
6. DESIGNATES A CRIMP CONNECTION
7. DESIGNATES A WIRE JOINT CRIMP CONNECTION
8.

WIRE TYPE	WIRE NUMBERS
BLK 16 AWG	3, 9, 11, 13
WHT 16 AWG	14, 6, 8
GRN 16 AWG	10, 16, 18
BRN 16 AWG	1
BLU 16 AWG	2
GRN/YEL 16 AWG	4
RED 16 AWG	5
ORN 16 AWG	7
WHT 14 AWG	12
BLK 14 AWG	15, 17
WHT 22 AWG	20, 22, 24, 26, 28
WHT 18 AWG	14
BLK 18 AWG	9
BLK 22 AWG	27, 29, 31

UNLESS OTHERWISE SPECIFIED			
ALL DIM. IN INCHES	LINEAR TOL.	.XX	
		.XXX	
	ANGLE TOL.		
MATL.			
FINISH			

DO NOT SCALE DRAWING		
DRAWN	MJG	4/21/04
CHECK		
ENGR.		
MFG.		
QUAL. C		
MRKTG.		

OLYMPIC MEDICAL CORP
SEATTLE, WASHINGTON

WIRING DIAGRAM
BL80/81 120V 60 Hz

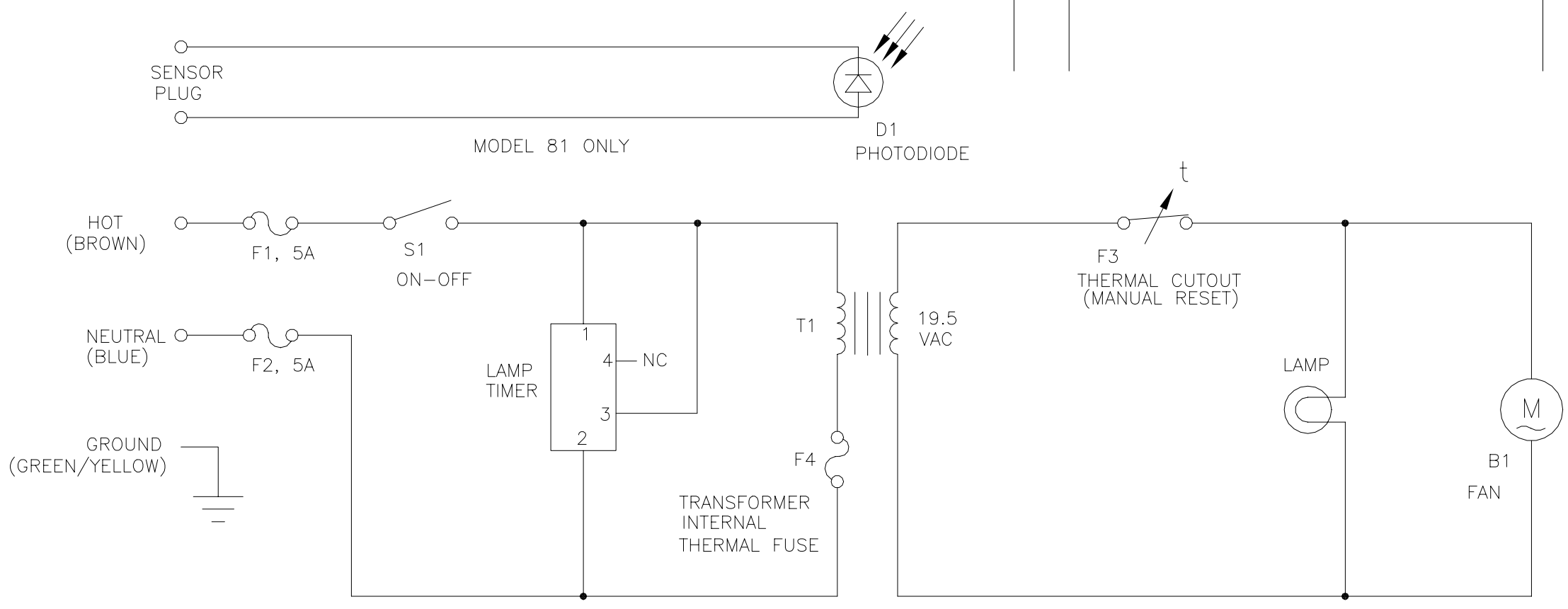
SIZE C | 700243

SCALE NONE | REV. – | SHEET 1 OF 1

Figure A.2 Bili-Lite, Model 80/81— Schematic, Drawing No. 700244, Rev. –

THIS DRAWING AND SPECIFICATIONS HEREIN, ARE THE PROPERTY OF THE OLYMPIC MEDICAL CORP. AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.

REVISIONS				
LTR	DESCRIPTION	ECN	DATE	APPROVAL
–	PRODUCTION RELEASE			



UNLESS OTHERWISE SPECIFIED			
ALL DIM. IN INCHES	LINEAR TOL.	.XX	
		.XXX	
	ANGLE TOL.		
MATL.			
FINISH			

DO NOT SCALE DRAWING		
DRAWN	MJG	4/20/04
CHECK		
ENGR.		
MFG.		
QUAL. C		
MRKTG.		

OLYMPIC MEDICAL CORP
SEATTLE, WASHINGTON

SCHEMATIC
BL 80/81 120V–60Hz

SIZE B | 700244 | SCALE NONE | REV. – | SHEET 1 OF 1